RAW SEQUENCE LISTING

The Biotechnology Systems Branch of the Scientific and Technical
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Application Serial Number: _09/852,922C_

Source: _1FW/6_

Date Processed by STIC: _10/12/06_

ENTERED

RAW SEQUENCE LISTING   DATE: 10/12/2006
PATENT APPLICATION: US/09/852,922C   TIME: 14:24:52

Input Set : A:\10089_14 Sequence Listing 1-37 (Oct. 5, 2006).DOC
Output Set: N:\CRF4\10122006\I852922C.raw

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       2 <110> APPLICANT: TOYO BOSEKI KABUSHIKI KAISHA
W-->   3 <120> TITLE OF INVENTION: MODIFIED THERMOSTABLE DNA POLYMERASE
W-->   4 <130> FILE REFERENCE: 10089/14
W-->   5 <140> CURRENT APPLICATION NUMBER: US 09/852,922C
       6 <141> CURRENT FILING DATE: 2001-05-10
       7 <150> PRIOR APPLICATION NUMBER: JP 2000-138796
       8 <151> PRIOR FILING DATE: 2000-05-11
W-->   9 <160> NUMBER OF SEQ ID: 37
      10 <170> SOFTWARE: PatentIn Ver. 2.1
W-->  11 <210> SEQ ID NO: 1
      12 <211> LENGTH: 5342
      13 <212> TYPE: DNA
      14 <213> ORGANISM: Pyrococcus kodakaraensis
W-->  15 <220> FEATURE:
      16 <221> NAME/KEY: CDS
      17 <222> LOCATION: (156)..(5165)
      18 <223> OTHER INFORMATION: 1374-2453 intron, 2709-4316 intron
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      23 ataacggaga aaaatgggga gctattacga tctctccttg atgtggggtt tacaataaag 120
      25 cctggattgt tctacaagat tatgggggat gaaag atg atc ctc gac act gac     173
      26                                         Met Ile Leu Asp Thr Asp
      27                                           1               5
      29 tac ata acc gag gat gga aag cct gtc ata aga att ttc aag aag gaa   221
      30 Tyr Ile Thr Glu Asp Gly Lys Pro Val Ile Arg Ile Phe Lys Lys Glu
      31             10              15                  20
      33 aac ggc gag ttt aag att gag tac gac cgg act ttt gaa ccc tac ttc   269
      34 Asn Gly Glu Phe Lys Ile Glu Tyr Asp Arg Thr Phe Glu Pro Tyr Phe
      35         25                  30                  35
      37 tac gcc ctc ctg aag gac gat tct gcc att gag gaa gtc aag aag ata   317
      38 Tyr Ala Leu Leu Lys Asp Asp Ser Ala Ile Glu Glu Val Lys Lys Ile
      39     40                  45                  50
      41 acc gcc gag agg cac ggg acg gtt gta acg gtt aag cgg gtt gaa aag   365
      42 Thr Ala Glu Arg His Gly Thr Val Val Thr Val Lys Arg Val Glu Lys
      43 55                  60                  65                  70
      45 gtt cag aag aag ttc ctc ggg aga cca gtt gag gtc tgg aaa ctc tac   413
      46 Val Gln Lys Lys Phe Leu Gly Arg Pro Val Glu Val Trp Lys Leu Tyr
      47                 75                  80                  85
      49 ttt act cat ccg cag gac gtc cca gcg ata agg gac aag ata cga gag   461
      50 Phe Thr His Pro Gln Asp Val Pro Ala Ile Arg Asp Lys Ile Arg Glu
      51                 90                  95                  100
      53 cat ggg gca gtt att gac atc tac gag tac gac ata ccc ttc gcc aag   509
      54 His Gly Ala Val Ile Asp Ile Tyr Glu Tyr Asp Ile Pro Phe Ala Lys
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55          105                 110                 115
57 cgc tac ctc ata gac aag gga tta gtg cca atg gaa ggc gac gag gag     557
58 Arg Tyr Leu Ile Asp Lys Gly Leu Val Pro Met Glu Gly Asp Glu Glu
59      120                 125                 130
61 ctg aaa atg ctc gcc ttc gac att gaa act ctc tac cat gag ggc gag     605
62 Leu Lys Met Leu Ala Phe Asp Ile Glu Thr Leu Tyr His Glu Gly Glu
63 135             140                 145                 150
65 gag ttc gcc gag ggg cca atc ctt atg ata agc tac gcc gac gag gaa     653
66 Glu Phe Ala Glu Gly Pro Ile Leu Met Ile Ser Tyr Ala Asp Glu Glu
67              155                 160                 165
69 ggg gcc agg gtg ata act tgg aag aac gtg gat ctc ccc tac gtt gac     701
70 Gly Ala Arg Val Ile Thr Trp Lys Asn Val Asp Leu Pro Tyr Val Asp
71              170                 175                 180
73 gtc gtc tcg acg gag agg gag atg ata aag cgc ttc ctc cgt gtt gtg     749
74 Val Val Ser Thr Glu Arg Glu Met Ile Lys Arg Phe Leu Arg Val Val
75      185                 190                 195
77 aag gag aaa gac ccg gac gtt ctc ata acc tac aac ggc gac aac ttc     797
78 Lys Glu Lys Asp Pro Asp Val Leu Ile Thr Tyr Asn Gly Asp Asn Phe
79      200                 205                 210
81 gac ttc gcc tat ctg aaa aag cgc tgt gaa aag ctc gga ata aac ttc     845
82 Asp Phe Ala Tyr Leu Lys Lys Arg Cys Glu Lys Leu Gly Ile Asn Phe
83 215             220                 225                 230
85 gcc ctc gga agg gat gga agc gag ccg aag att cag agg atg ggc gac     893
86 Ala Leu Gly Arg Asp Gly Ser Glu Pro Lys Ile Gln Arg Met Gly Asp
87              235                 240                 245
89 agg ttt gcc gtc gaa gtg aag gga cgg ata cac ttc gat ctc tat cct     941
90 Arg Phe Ala Val Glu Val Lys Gly Arg Ile His Phe Asp Leu Tyr Pro
91      250                 255                 260
93 gtg ata aga cgg acg ata aac ctg ccc aca tac acg ctt gag gcc gtt     989
94 Val Ile Arg Arg Thr Ile Asn Leu Pro Thr Tyr Thr Leu Glu Ala Val
95      265                 270                 275
97 tat gaa gcc gtc ttc ggt cag ccg aag gag aag gtt tac gct gag gaa     1037
98 Tyr Glu Ala Val Phe Gly Gln Pro Lys Glu Lys Val Tyr Ala Glu Glu
99      280                 285                 290
101 ata acc aca gcc tgg gaa acc ggc gag aac ctt gag aga gtc gcc cgc    1085
102 Ile Thr Thr Ala Trp Glu Thr Gly Glu Asn Leu Glu Arg Val Ala Arg
103 295                 300                 305                 310
105 tac tcg atg gaa gat gcg aag gtc aca tac gag ctt ggg aag gag ttc    1133
106 Tyr Ser Met Glu Asp Ala Lys Val Thr Tyr Glu Leu Gly Lys Glu Phe
107              315                 320                 325
109 ctt ccg atg gag gcc cag ctt tct cgc tta atc ggc cag tcc ctc tgg    1181
110 Leu Pro Met Glu Ala Gln Leu Ser Arg Leu Ile Gly Gln Ser Leu Trp
111              330                 335                 340
113 gac gtc tcc cgc tcc agc act ggc aac ctc gtt gag tgg ttc ctc ctc    1229
114 Asp Val Ser Arg Ser Ser Thr Gly Asn Leu Val Glu Trp Phe Leu Leu
115              345                 350                 355
117 agg aag gcc tat gag agg aat gag ctg gcc ccg aac aag ccc gat gaa    1277
118 Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala Pro Asn Lys Pro Asp Glu
119      360                 365                 370
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121 aag gag ctg gcc aga aga cgg cag agc tat gaa gga ggc tat gta aaa   1325
122 Lys Glu Leu Ala Arg Arg Arg Gln Ser Tyr Glu Gly Gly Tyr Val Lys
123 375             380             385             390
125 gag ccc gag aga ggg ttg tgg gag aac ata gtg tac cta gat ttt aga   1373
126 Glu Pro Glu Arg Gly Leu Trp Glu Asn Ile Val Tyr Leu Asp Phe Arg
127             395             400             405
129 tgc cat cca gcc gat acg aag gtt gtc gtc aag ggg aag ggg att ata   1421
130 Cys His Pro Ala Asp Thr Lys Val Val Val Lys Gly Lys Gly Ile Ile
131         410             415             420
133 aac atc agc gag gtt cag gaa ggt gac tat gtc ctt ggg att gac ggc   1469
134 Asn Ile Ser Glu Val Gln Glu Gly Asp Tyr Val Leu Gly Ile Asp Gly
135         425             430             435
137 tgg cag aga gtt aga aaa gta tgg gaa tac gac tac aaa ggg gag ctt   1517
138 Trp Gln Arg Val Arg Lys Val Trp Glu Tyr Asp Tyr Lys Gly Glu Leu
139         440             445             450
141 gta aac ata aac ggg tta aag tgt acg ccc aat cat aag ctt ccc gtt   1565
142 Val Asn Ile Asn Gly Leu Lys Cys Thr Pro Asn His Lys Leu Pro Val
143 455             460             465             470
145 gtt aca aag aac gaa cga caa acg aga ata aga gac agt ctt gct aag   1613
146 Val Thr Lys Asn Glu Arg Gln Thr Arg Ile Arg Asp Ser Leu Ala Lys
147             475             480             485
149 tct ttc ctt act aaa aaa gtt aag ggc aag ata ata acc act ccc ctt   1661
150 Ser Phe Leu Thr Lys Lys Val Lys Gly Lys Ile Ile Thr Thr Pro Leu
151         490             495             500
153 ttc tat gaa ata ggc aga gcg aca agt gag aat att cca gaa gaa gag   1709
154 Phe Tyr Glu Ile Gly Arg Ala Thr Ser Glu Asn Ile Pro Glu Glu Glu
155         505             510             515
157 gtt ctc aag gga gag ctc gct ggc ata cta ttg gct gaa gga acg ctc   1757
158 Val Leu Lys Gly Glu Leu Ala Gly Ile Leu Leu Ala Glu Gly Thr Leu
159         520             525             530
161 ttg agg aaa gac gtt gaa tac ttt gat tca tcc cgc aaa aaa cgg agg   1805
162 Leu Arg Lys Asp Val Glu Tyr Phe Asp Ser Ser Arg Lys Lys Arg Arg
163 535             540             545             550
165 att tca cac cag tat cgt gtt gag ata acc att ggg aaa gac gag gag   1853
166 Ile Ser His Gln Tyr Arg Val Glu Ile Thr Ile Gly Lys Asp Glu Glu
167             555             560             565
169 gag ttt agg gat cgt atc aca tac att ttt gag cgt ttg ttt ggg att   1901
170 Glu Phe Arg Asp Arg Ile Thr Tyr Ile Phe Glu Arg Leu Phe Gly Ile
171         570             575             580
173 act cca agc atc tcg gag aag aaa gga act aac gca gta aca ctc aaa   1949
174 Thr Pro Ser Ile Ser Glu Lys Lys Gly Thr Asn Ala Val Thr Leu Lys
175         585             590             595
177 gtt gcg aag aag aat gtt tat ctt aaa gtc aag gaa att atg gac aac   1997
178 Val Ala Lys Lys Asn Val Tyr Leu Lys Val Lys Glu Ile Met Asp Asn
179 600             605             610
181 ata gag tcc cta cat gcc ccc tcg gtt ctc agg gga ttc ttc gaa ggc   2045
182 Ile Glu Ser Leu His Ala Pro Ser Val Leu Arg Gly Phe Phe Glu Gly
183 615             620             625             630
185 gac ggt tca gta aac agg gtt agg agg agt att gtt gca acc cag ggt   2093
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186 Asp Gly Ser Val Asn Arg Val Arg Arg Ser Ile Val Ala Thr Gln Gly
187             635                 640                 645
189 aca aag aac gag tgg aag att aaa ctg gtg tca aaa ctg ctc tcc cag   2141
190 Thr Lys Asn Glu Trp Lys Ile Lys Leu Val Ser Lys Leu Leu Ser Gln
191             650                 655                 660
193 ctt ggt atc cct cat caa acg tac acg tat cag tat cag gaa aat ggg   2189
194 Leu Gly Ile Pro His Gln Thr Tyr Thr Tyr Gln Tyr Gln Glu Asn Gly
195             665                 670                 675
197 aaa gat cgg agc agg tat ata ctg gag ata act gga aag gac gga ttg   2237
198 Lys Asp Arg Ser Arg Tyr Ile Leu Glu Ile Thr Gly Lys Asp Gly Leu
199     680                 685                 690
201 ata ctg ttc caa aca ctc att gga ttc atc agt gaa aga aag aac gct   2285
202 Ile Leu Phe Gln Thr Leu Ile Gly Phe Ile Ser Glu Arg Lys Asn Ala
203 695                 700                 705                 710
205 ctg ctt aat aag gca ata tct cag agg gaa atg aac aac ttg gaa aac   2333
206 Leu Leu Asn Lys Ala Ile Ser Gln Arg Glu Met Asn Asn Leu Glu Asn
207             715                 720                 725
209 aat gga ttt tac agg ctc agt gaa ttc aat gtc agc acg gaa tac tat   2381
210 Asn Gly Phe Tyr Arg Leu Ser Glu Phe Asn Val Ser Thr Glu Tyr Tyr
211             730                 735                 740
213 gag ggc aag gtc tat gac tta act ctt gaa gga act ccc tac tac ttt   2429
214 Glu Gly Lys Val Tyr Asp Leu Thr Leu Glu Gly Thr Pro Tyr Tyr Phe
215             745                 750                 755
217 gcc aat ggc ata ttg acc cat aac tcc ctg tac ccc tca atc atc atc   2477
218 Ala Asn Gly Ile Leu Thr His Asn Ser Leu Tyr Pro Ser Ile Ile Ile
219     760                 765                 770
221 acc cac aac gtc tcg ccg gat acg ctc aac aga gaa gga tgc aag gaa   2525
222 Thr His Asn Val Ser Pro Asp Thr Leu Asn Arg Glu Gly Cys Lys Glu
223 775                 780                 785                 790
225 tat gac gtt gcc cca cag gtc ggc cac cgc ttc tgc aag gac ttc cca   2573
226 Tyr Asp Val Ala Pro Gln Val Gly His Arg Phe Cys Lys Asp Phe Pro
227             795                 800                 805
229 gga ttt atc ccg agc ctg ctt gga gac ctc cta gag gag agg cag aag   2621
230 Gly Phe Ile Pro Ser Leu Leu Gly Asp Leu Leu Glu Glu Arg Gln Lys
231             810                 815                 820
233 ata aag aag aag atg aag gcc acg att gac ccg atc gag agg aag ctc   2669
234 Ile Lys Lys Lys Met Lys Ala Thr Ile Asp Pro Ile Glu Arg Lys Leu
235             825                 830                 835
237 ctc gat tac agg cag agg gcc atc aag atc ctg gca aac agc atc cta   2717
238 Leu Asp Tyr Arg Gln Arg Ala Ile Lys Ile Leu Ala Asn Ser Ile Leu
239     840                 845                 850
241 ccc gag gaa tgg ctt cca gtc ctc gag gaa ggg gag gtt cac ttc gtc   2765
242 Pro Glu Glu Trp Leu Pro Val Leu Glu Glu Gly Glu Val His Phe Val
243 855                 860                 865                 870
245 agg att gga gag ctc ata gac cgg atg atg gag gaa aat gct ggg aaa   2813
246 Arg Ile Gly Glu Leu Ile Asp Arg Met Met Glu Glu Asn Ala Gly Lys
247             875                 880                 885
249 gta aag aga gag ggc gag acg gaa gtg ctt gag gtc agt ggg ctt gaa   2861
250 Val Lys Arg Glu Gly Glu Thr Glu Val Leu Glu Val Ser Gly Leu Glu
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251           890              895              900
253 gtc ccg tcc ttt aac agg aga act aac aag gcc gag ctc aag aga gta   2909
254 Val Pro Ser Phe Asn Arg Arg Thr Asn Lys Ala Glu Leu Lys Arg Val
255           905              910              915
257 aag gcc ctg att agg cac gat tat tct ggc aag gtc tac acc atc aga   2957
258 Lys Ala Leu Ile Arg His Asp Tyr Ser Gly Lys Val Tyr Thr Ile Arg
259     920              925              930
261 ctg aag tcg ggg agg aga ata aag ata acc tct ggc cac agc ctc ttc   3005
262 Leu Lys Ser Gly Arg Arg Ile Lys Ile Thr Ser Gly His Ser Leu Phe
263 935              940          .   945              950
265 tct gtg aga aac ggg gag ctc gtt gaa gtt acg ggc gat gaa cta aag   3053
266 Ser Val Arg Asn Gly Glu Leu Val Glu Val Thr Gly Asp Glu Leu Lys
267           955              960              965
269 cca ggt gac ctc gtt gca gtc ccg cgg aga ttg gag ctt cct gag aga   3101
270 Pro Gly Asp Leu Val Ala Val Pro Arg Arg Leu Glu Leu Pro Glu Arg
271           970              975              980
273 aac cac gtg ctg aac ctc gtt gaa ctg ctc ctt gga acg cca gaa gaa   3149
274 Asn His Val Leu Asn Leu Val Glu Leu Leu Leu Gly Thr Pro Glu Glu
275           985              990              995
277 gaa act ttg gac atc gtc atg acg atc cca gtc aag ggt aag aag aac   3197
278 Glu Thr Leu Asp Ile Val Met Thr Ile Pro Val Lys Gly Lys Lys Asn
279     1000             1005             1010
281 ttc ttt aaa ggg atg ctc agg act ttg cgc tgg att ttc gga gag gaa   3245
282 Phe Phe Lys Gly Met Leu Arg Thr Leu Arg Trp Ile Phe Gly Glu Glu
283 1015             1020             1025             1030
285 aag agg ccc aga acc gcg aga cgc tat ctc agg cac ctt gag gat ctg   3293
286 Lys Arg Pro Arg Thr Ala Arg Arg Tyr Leu Arg His Leu Glu Asp Leu
287           1035             1040             1045
289 ggc tat gtc cgg ctt aag aag atc ggc tac gaa gtc ctc gac tgg gac   3341
290 Gly Tyr Val Arg Leu Lys Lys Ile Gly Tyr Glu Val Leu Asp Trp Asp
291           1050             1055             1060
293 tca ctt aag aac tac aga agg ctc tac gag gcg ctt gtc gag aac gtc   3389
294 Ser Leu Lys Asn Tyr Arg Arg Leu Tyr Glu Ala Leu Val Glu Asn Val
295           1065             1070             1075
297 aga tac aac ggc aac aag agg gag tac ctc gtt gaa ttc aat tcc atc   3437
298 Arg Tyr Asn Gly Asn Lys Arg Glu Tyr Leu Val Glu Phe Asn Ser Ile
299     1080             1085             1090
301 cgg gat gca gtt ggc ata atg ccc cta aaa gag ctg aag gag tgg aag   3485
302 Arg Asp Ala Val Gly Ile Met Pro Leu Lys Glu Leu Lys Glu Trp Lys
303 1095             1100             1105             1110
305 atc ggc acg ctg aac ggc ttc aga atg aga aag ctc att gaa gtg gac   3533
306 Ile Gly Thr Leu Asn Gly Phe Arg Met Arg Lys Leu Ile Glu Val Asp
307           1115             1120             1125
309 gag tcg tta gca aag ctc ctc ggc tac tac gtg agc gag ggc tat gca   3581
310 Glu Ser Leu Ala Lys Leu Leu Gly Tyr Tyr Val Ser Glu Gly Tyr Ala
311           1130             1135             1140
313 aga aag cag agg aat ccc aaa aac ggc tgg agc tac agc gtg aag ctc   3629
314 Arg Lys Gln Arg Asn Pro Lys Asn Gly Trp Ser Tyr Ser Val Lys Leu
315           1145             1150             1155
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